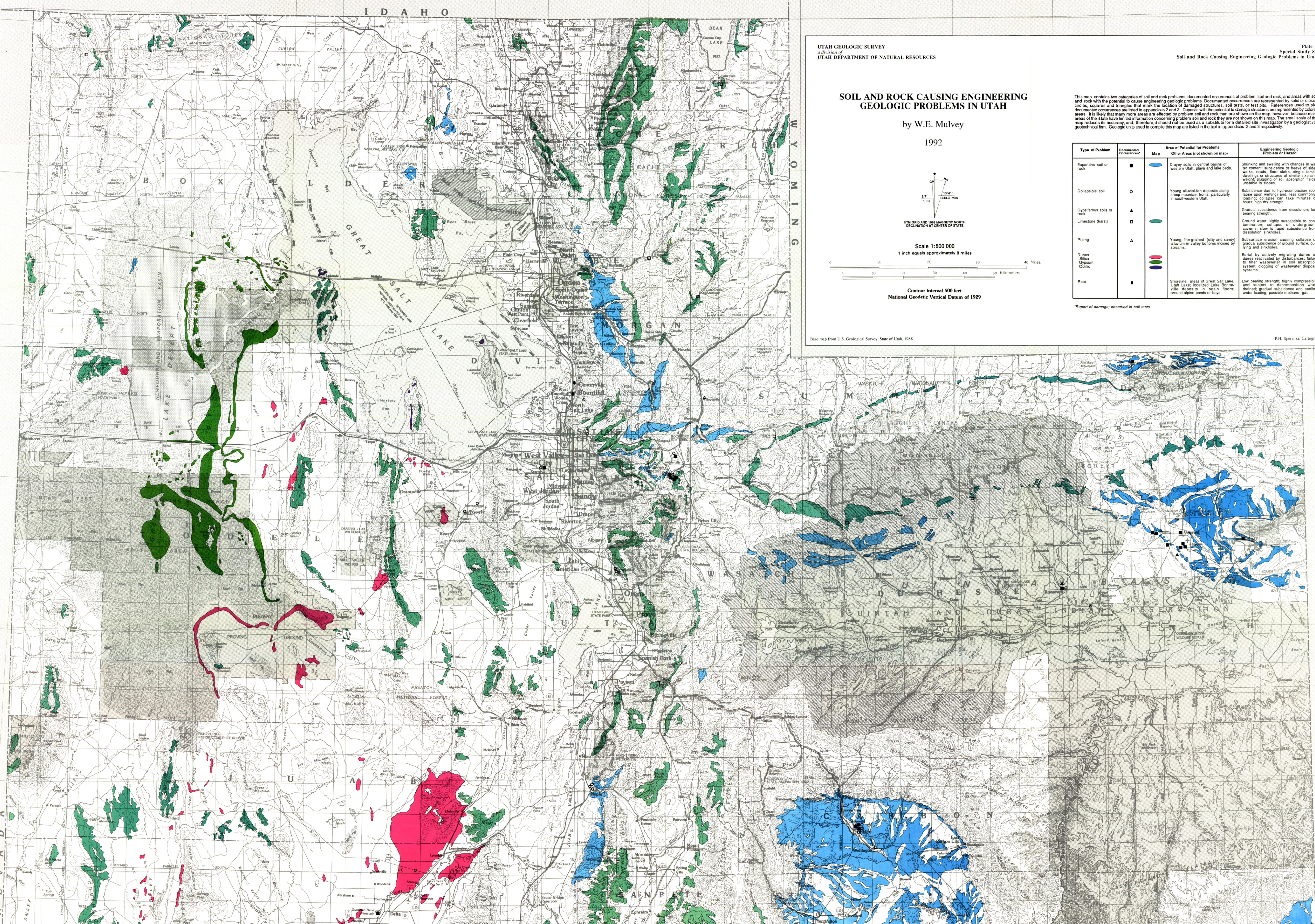


(ZONE 11) 114° (ZONE 12) 113° 112° 111° 110° 109°



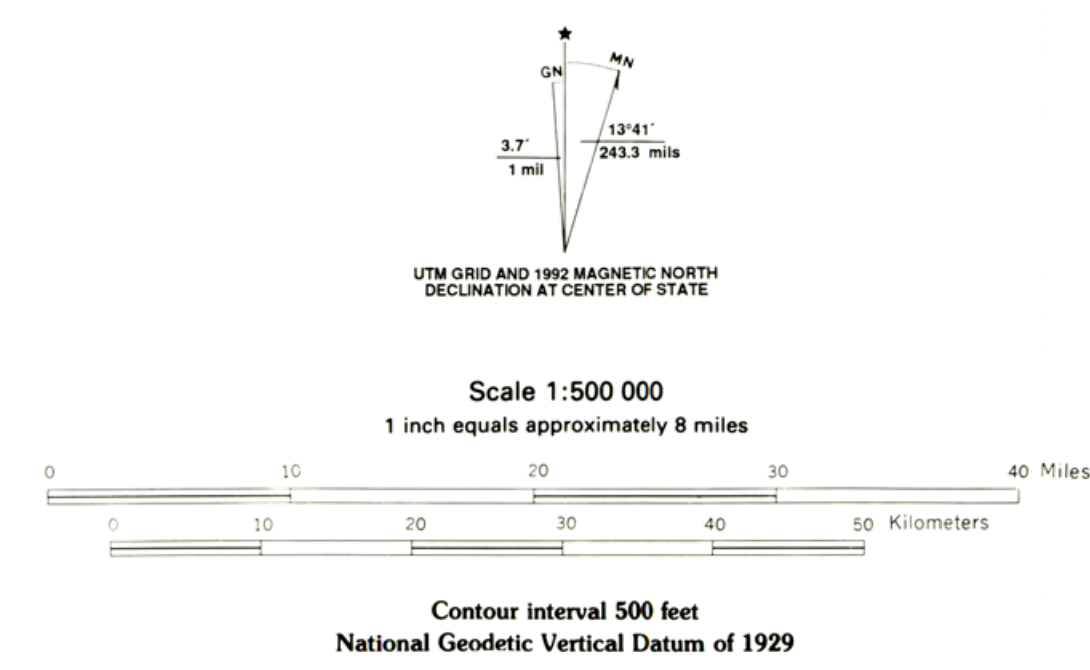
UTAH GEOLOGIC SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES

Plate 1
Special Study 80
Soil and Rock Causing Engineering Geologic Problems in Utah

SOIL AND ROCK CAUSING ENGINEERING GEOLOGIC PROBLEMS IN UTAH

by W.E. Mulvey

1992



Base map from U.S. Geological Survey, State of Utah, 1988.

P.H. Speranza, Cartographer

This map contains two categories of soil and rock problems: documented occurrences of problem soil and rock, and areas with soil and rock with the potential to cause engineering geologic problems. Documented occurrences are represented by solid or closed circles, squares and triangles that mark the location of damaged structures, soil tests, or test pits. References used to plot documented occurrences are listed in appendices 2 and 3. Deposits with the potential to damage structures are represented by colored areas. It is likely that many more areas are affected by problem soil and rock than are shown on the map; however, because many areas of the state have limited information concerning problem soil and rock they are not shown on this map. The small scale of the map reduces its accuracy, and, therefore, it should not be used as a substitute for a detailed site investigation by a geologist or geotechnical firm. Geologic units used to compile this map are listed in the text in appendices 2 and 3 respectively.

Type of Problem	Documented Occurrences*	Map	Area of Potential for Problems Other Areas (not shown on map)	Engineering Geologic Problem or Hazard
Expansive soil or rock	■	Blue outline	Clayey soils in central basins of western Utah; playa and lake beds.	Shrinking and swelling with changes in water content; subsidence or heave of side-walks, roads, floor slabs, single-family dwellings or structures of similar size and weight; plugging of absorption fields; unstable in slopes.
Collapsible soil	○	Blue outline	Young alluvial-fan deposits along steep mountain fronts, particularly in southwestern Utah.	Subsidence due to hydrocompaction (collapse upon wetting) and, less commonly, loading; collapse can take minutes or hours; high dry strength.
Gypsiferous soils or rock	▲	Blue outline		Gradual subsidence from dissolution; low bearing strength.
Limestone (karst)	□	Blue outline		Ground water highly susceptible to contamination; collapse of underground caverns; slow to rapid subsidence from dissolution sinkholes.
Piping	△	Blue outline	Young, fine-grained (silt and sandy) alluvium in valley bottoms incised by streams.	Subsurface erosion causing collapse or gradual subsidence of ground surface; gulping and sinkholes.
Dunes	●	Red outline		Burial by actively migrating dunes or dunes reactivated by disturbances; failure to filter wastewater in soil absorption system; clogging of wastewater disposal systems.
Silica	●	Red outline		
Oolitic	●	Red outline		
Peat	●	Red outline	Shoreline areas of Great Salt Lake, Utah Lake, localized Lake Bonneville deposits in basin floors; around saline ponds or bays.	Low bearing strength; highly compressible and subject to decomposition when drained; gradual subsidence and settling under loading; possible methane gas.

*Report of damage; observed in soil tests.

